S-type Separation System

Operating Instructions

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1 Operating

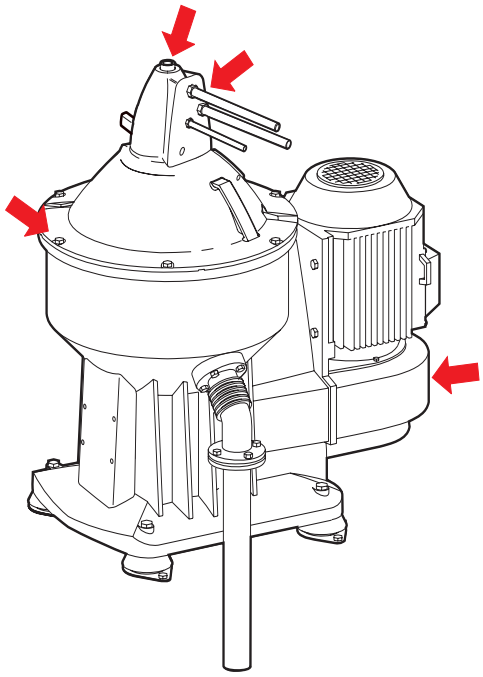
1.1 Before Startup

1 Check that the separator is correctly assembled and connected to power supply of correct voltage and frequency. The EPC 50 Control Unit must be ON.

WARNING

Breakdown hazard

Assemble the separator completely before start. All couplings, covers, and guards must be in place and properly tightened. Non compliance may lead to breakdown.



P003594A

WARNING

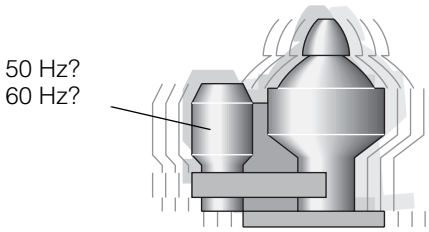
Electrical hazard

Follow local regulations for electrical installation and earthing (grounding).

WARNING

Breakdown hazard

Check that the power frequency is in agreement with the machine plate. If incorrect, resulting overspeed may cause breakdown.



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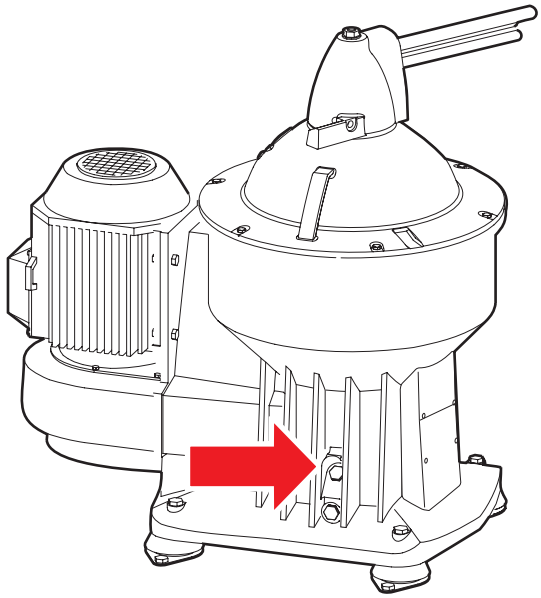
WARNING

Use the separation system for the purpose, and within the limits, specified by Alfa Laval. Failure to do so could cause a violent breakdown.

2 Check the oil sump level. If necessary, unscrew the level stick-plug, and top up until oil starts to run from the oil-filling hole.

NOTE

Too much or too little oil can damage the separator bearings.



G0868542

Rotation Direction

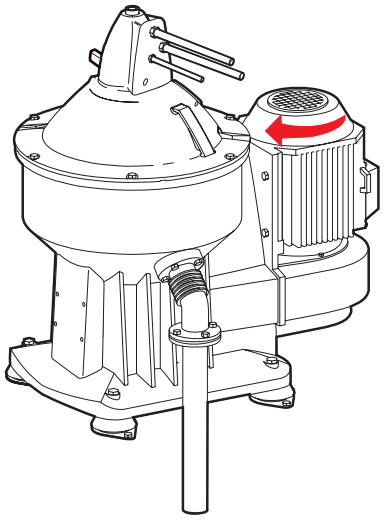
To check the rotation of the bowl, do a quick start/stop. The motor fan must rotate in a clockwise direction.

CAUTION

If power cable polarity has been reversed, the separator will rotate in reverse, and vital rotating parts can loosen.

NOTE

To make this check, the Mode Selector Switch should be in the CIP position.

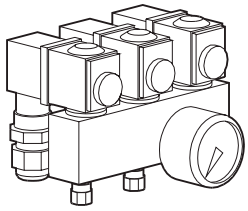


P003593A

Air Valve Block

Use the pressure gauge situated in the air valve block to check that the air supply is correct (500 – 700 kPa or 5 – 7 Bar).

For further information concerning air, see chapter *1 Technical Data* in the *System Reference/ Installation Instructions* booklet.



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Operating Water Pressure

Check that the operating water pressure is sufficient (200 – 600 kPa or 2 – 6 Bar).

For further information concerning water, see chapter *1 Technical Data* in the *System Reference/ Installation Instructions* booklet.

1.2 Operators Panel

General principle for changing control parameters

The 'Enter' button is used to:

- enter into a parameter list
- enter into a parameter
- accept/store a new parameter value.

The '+' or the '–' buttons are used to change the value flashing in the display window.

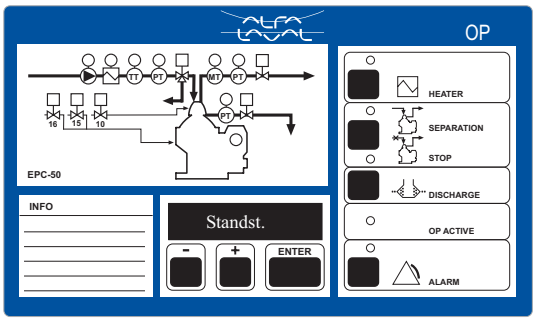
Process parameters

Set the process parameters to suit the installation as follows:

1 Push 'Enter'. Parameter no. 1 in the process parameter list is shown.
You have now come to the process parameter list. Go through the list and set parameters.

2 When the parameters have been set, 'End I/O' (flashing) shows. Push '+'. 'Standst.' now shows in the display.

For information on how to set discharge intervals, see chapter *3 Process Parameters* in the *Paramete list* booklet.



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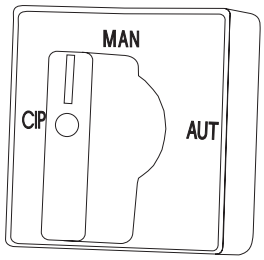
NOTE

Make sure that the operators panel is 'active' (LED green) before operating.

1.3 Startup

The control panel mode switch has three positions: ‘MANUAL’, ‘AUTO’, and ‘CIP’.

The ‘MANUAL’ mode is for use on all Separation Unit systems.



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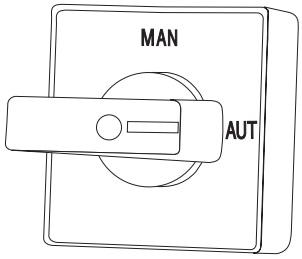
The ‘AUTO’ mode is for use on systems supplied for fully automatic control and/or fully automatic remote control. The following general rules apply for use of the ‘AUTO’ mode:

- The EPC 50 must have control of the oil feed pump.
- The EPC 50 must have control of the heater.
- The EPC 50 must have control of vibration monitoring.
- The cover interlock must be fitted.



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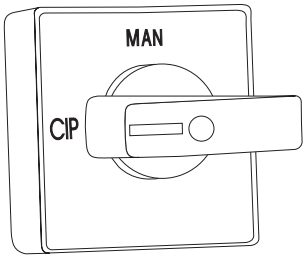
The ‘CIP’ mode is for use with Cleaning in Place equipment. See *“Cleaning In Place”* on page 17.



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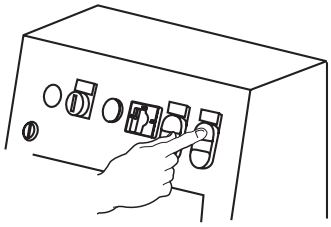
1.4 Manual Startup

The first startup must always be carried out manually.

Before startup make sure that all the main supply valves for air, oil, and water are open. Open heating media supply valve if applicable. Switch on the power supplies. Make sure the mode selection switch is in the 'MANUAL' position.

1 Start the oil feed pump from the pump starter.



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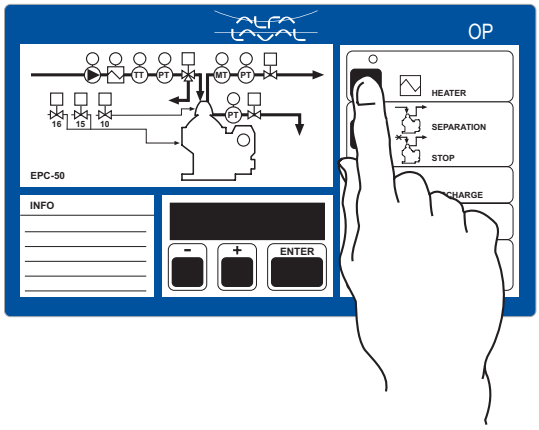
2 If necessary, vent air from the heater through the relief valve (if applicable).
Switch on the heater from the operator panel (if applicable).

NOTE

The operators panel must be' active' to allow operation.



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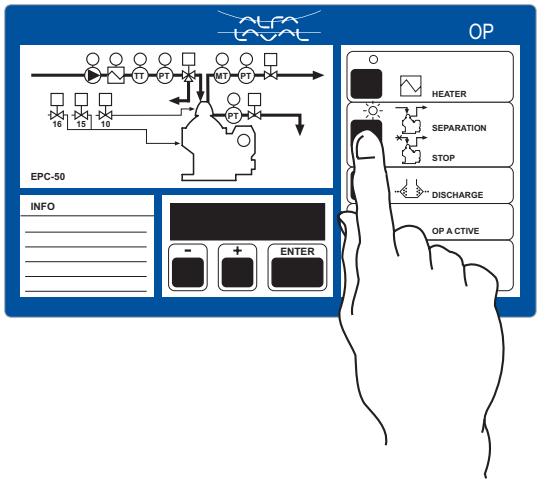
3 Press the 'SEPARATION' button to activate the EPC-50.



P00361LB

Before the separator can be started, a number of questions scroll across the display which have to be answered:

'Has the bowl been dismantled? + = YES, – = NO'

4 If the bowl has been dismantled press the '+' button.

P003614A

If no work has been carried out on the bowl, press the '–' button. The start sequence begins and the text 'Start' appears in the display.

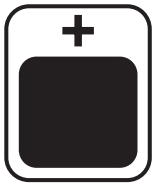
P003613A

NOTE

If this is the first start, answer 'YES'.

'Assembled according to manual? + = YES, – = NO'

5 If the bowl has been dismantled and assembled according to the instructions in the *Service Manual*, press the '+' button.

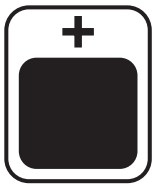


P003614A

'Bowl cleaned? + = YES, – = NO'

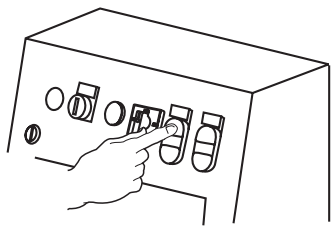
6 If the bowl has been cleaned press the '+' button.

An automatic calibration of the system is carried out. See display.



P003614A

7 Push the separator start button.



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8 Listen and observe.

Vibration may occur during start up, when passing critical speeds.This is normal and should pass without danger.

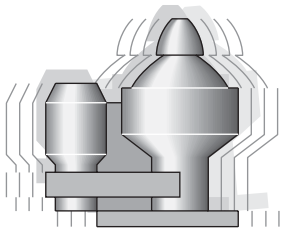
If vibration increases, or continues at full speed, press the emergency stop button and stand clear until the vibration stops. The separator and heater are stopped when the emergency stop button is pushed. The feed pump stops max. 3 minutes afterwards.

The emergency stop will only reset when the speed sensor indicates zero speed.

Once the zero speed signal has been received, the alarm reset button can be pushed. The message ‘ Switch power on/off.’ will be displayed. This refers to the EPC 50 power indside the control cabinet.

The cause of vibration must be determined and corrected before starting again!

See the *Alarms and Fault Finding* booklet.



P003606A

WARNING

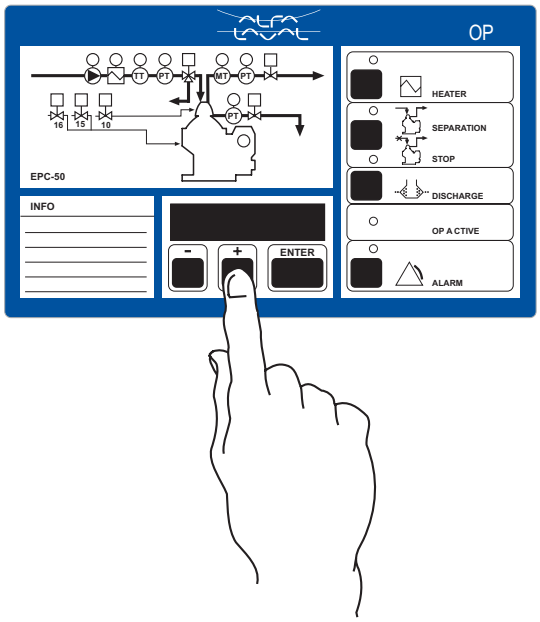
Breakdown hazard

Always observe the separator during start-up after assembly. If strong vibration occurs, stop by using the Emergency Stop button and evacuate the room.

NOTE

If the system is equipped with a vibration sensor, and has control of heater and feed pump, the Auto Start can be used.

9 The separator speed, and 'Start.' are shown alternately in the display until the separator is at full speed.



P00361KB

10 Check the oil feed temperature by pressing the '+' button until 'TT1' is shown on the display.

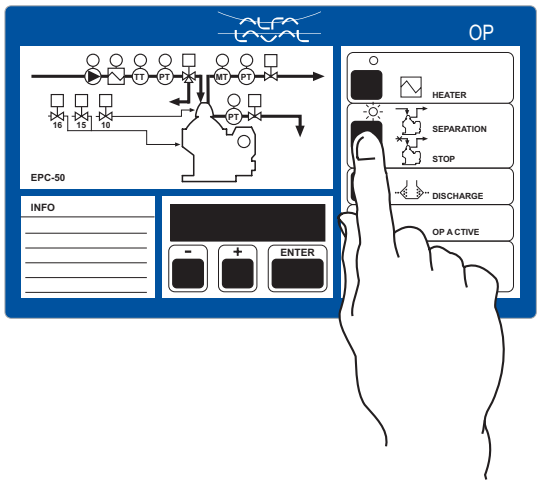
11 Wait until the oil feed temperature is correct:

Heavy fuel mode 98 °C

Lube oil mode 95 °C (trunk engines), or 90 °C (cross-head engines)

Diesel oil mode 40 °C

12 'Standby' is displayed when the separator has reached the correct speed, and the oil is at the correct temperature. The process starts automatically.



P00361LB

13 Adjust the backpressure to the normal running value. Normal running backpressure is determined at commissioning. See the *System Reference/Installation Instructions* booklet.

1.5 During operation

Operator panel information

Observe the operator panel information:

- Heater operation LED lit (green)
- Separator system operation LED lit (green)
- Activated valve LED lit (green)

During normal operation, the ALCAP trigger signal is shown on the left of the display, and the time to next sludge discharge is shown on the right.

Any alarm is indicated on the display. For further information see the *Alarms and Fault Finding* booklet.

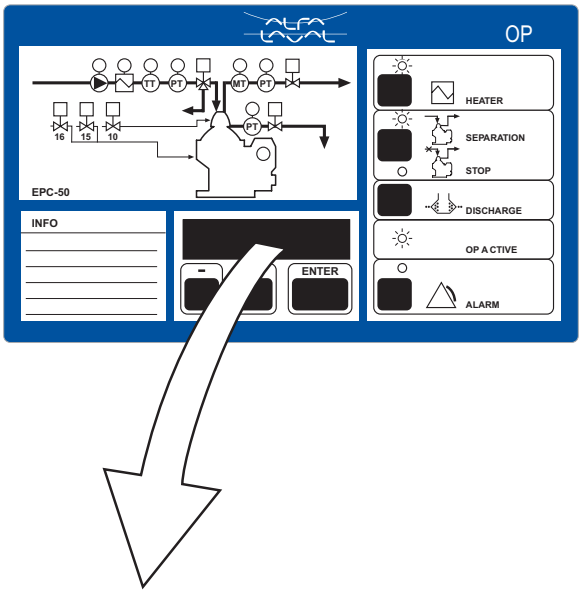
NOTE

Regularly check connections. Tighten if necessary.

NOTE

The values displayed in the examples below are not recommendations.

More operational information may be read as required, by pressing the '+' button repeatedly.



P003611MB

To return to normal display, i.e. the trigger value, and time to next sludge discharge, continue pressing the '+' button.

- Oil feed temperature. For the correct separation temperature see the *System Reference/Installation Instructions* booklet.

P003611RA

- Oil pressure, oil inlet

P003611QA

- Oil pressure, oil outlet

P003611PA

- Pressure, water outlet

P003611OA

- Water transducer value

P003611TA

- Speed

P003611UA

- Accumulated operating time in hours

P003625A

CAUTION

Burn hazard

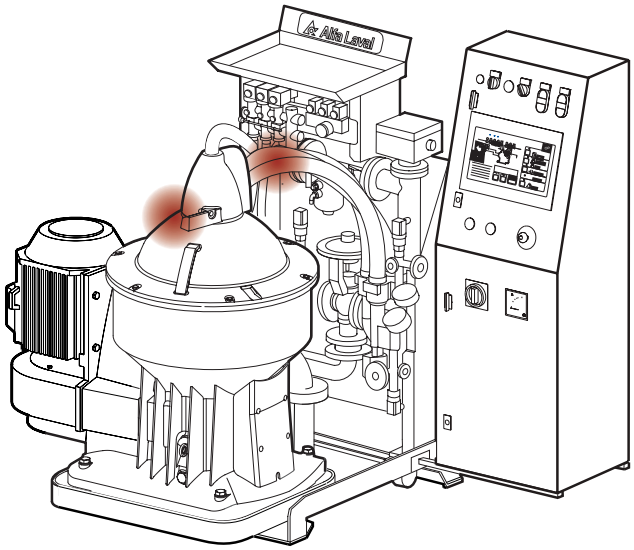
Avoid contact with hot surfaces. Process pipes, various machine surfaces, and processed liquid can be hot and cause burns.

WARNING

Breakdown hazard

If strong vibration occurs, press the emergency stop button and evacuate the room.

Never discharge a vibrating separator. Vibration may then become violent and result in breakdown.



CAUTION

Slip hazard

Check all connections for leakage.

Oil leakage may make the floor slippery.

WARNING

Noise hazard

Use ear protection if noise levels are high

P004072A

1.6 Stop

To stop the system:

1 Stop the system by pushing the 'SEPARATION' button on the operators panel.

The yellow LED for separator stop sequence starts to flash.

A sludge discharge is initiated.

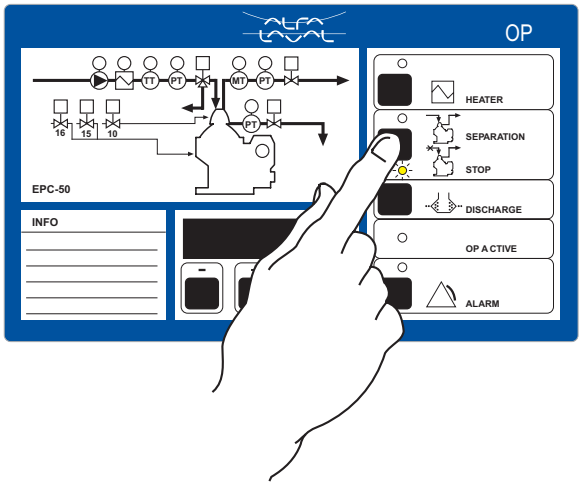
The stop sequence LED changes to steady yellow, and the green LED for separation system operation goes out, when the sludge discharge is completed.

'Stop' is displayed.

If the heater is controlled by the EPC 50, it is switched off automatically.

When the oil feed temperature has started to drop, the oil feed pump is switched off automatically.

When the separator comes to a complete standstill, 'Standst.' is displayed.



P003615SB

CAUTION

Breakdown hazard

Stop the separator by means of the control unit, and not by turning off the motor.

CAUTION

Never attempt to clean the bowl by manual discharge in connection with stop.

If the system is switched off for reasons other than high vibration, it is not necessary to wait for the separator to slow down before restarting the process. See *1.4 Manual Startup*, page 7.

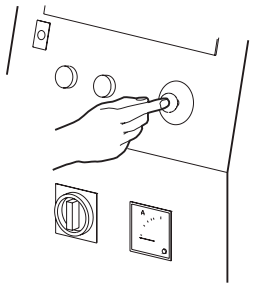
WARNING

Breakdown hazard

The system must not be restarted with the separator rotating if high vibration alarm has been given.

1.7 Emergency Stop

If an emergency situation occurs, press the emergency stop button and evacuate the room. Do not return until the separator has come to a complete standstill.



G046598A

WARNING

Disintegration hazard

If unusually strong vibration occurs, press the Emergency Stop button and leave the room

Do not enter the room after an emergency stop while the separator is still rotating.

NOTE

In order to be able to restart, the system must be at standstill, and then the EPC power switched off – on.

1.8 After Emergency Stop

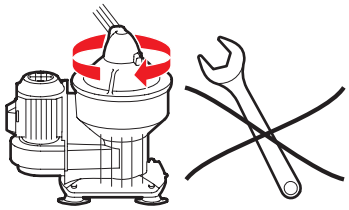
Separator standstill

Dismantling work must not be started before all rotating parts have come to a complete standstill.

DANGER

Entrapment hazard

Make sure that rotating parts have come to a complete standstill before starting any dismantling work. The rotation indicator lamp, where applicable, must be off.



I00293AA

Avoid accidental start

WARNING

Entrapment hazard

To avoid accidental start, switch off and lock power supply before starting any dismantling work.

Make sure that separator has come to a complete standstill before starting any dismantling work

Remedy the cause

The cause of the emergency must be remedied before attempting to restart the separator.

If the cause is not found, an overhaul must be performed on the separator, and all moving parts thoroughly checked

WARNING

Disintegration hazard

Do not start the separator after an emergency stop without first remedying the cause of the emergency.

Make sure that the bowl is clean before restart.

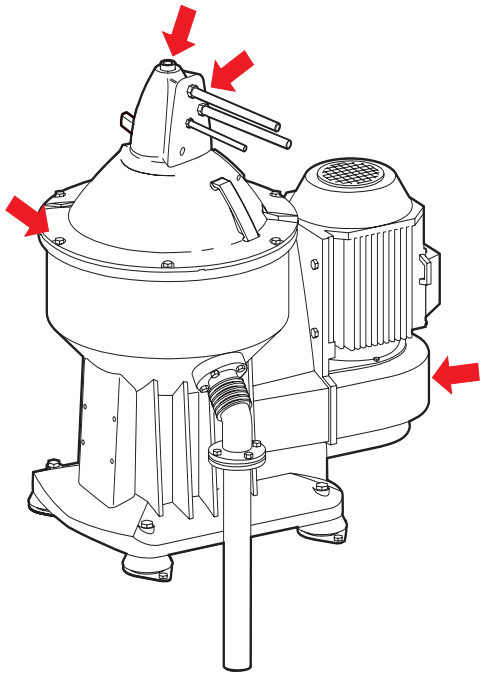
Separator reassembled

The separator must be fully reassembled with all covers and guards in place and tightened before unlocking the power supply and starting the system.

WARNING

Breakdown hazard

Assemble the separator completely before restart. All couplings, covers, and guards must be in place and properly tightened. Non compliance may lead to breakdown.



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1.9 Cleaning In Place

The use of Cleaning In Place (CIP) equipment is recommended for best separation results. For further information on the CIP equipment, see the *CIP* booklet, bookno. 1817261.

Before connecting the CIP equipment to the Separator, the switch on the control cabinet must be turned to the CIP position. This is to avoid accidental pumping of oil when the pipeline is opened up.

For instructions on how to connect the CIP equipment to the Separator, see the *Service Manual* booklet.

For recommended CIP intervals see chapter *1 Technical Data* in the *System Reference / Installation Instructions* booklet.

1.10 Automatic Operation

For automatic operation, the system must be equipped for automatic start. Make sure the mode selection switch is in the 'AUTO' position and Pr3 has the correct setting.

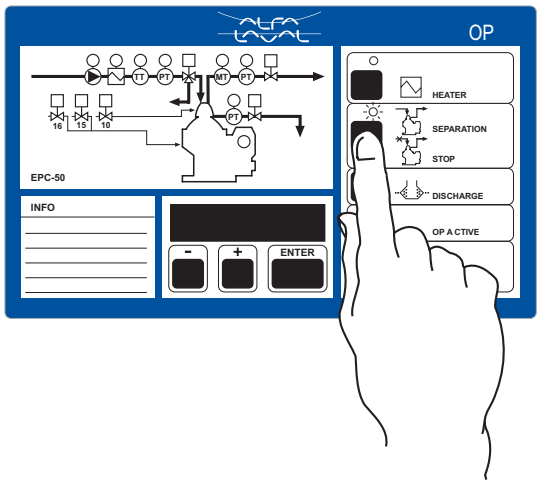
NOTE

If local control is needed (for example in an emergency situation), turn the switch to manual mode. This will automatically override the Pr3 setting.

NOTE

The first startup must always be carried out manually.
The system can thereafter be run automatically as long as no changes are made to it between runs.

1 Press the 'SEPARATION' button

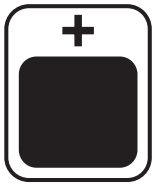


P00361LB

Before the separator can be started, a number of questions scroll across the display which have to be answered:

'Has the bowl been dismantled? + = YES, – = NO'

2 If the bowl has been dismantled press the '+' button.



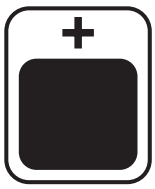
P003614A

If no work has been carried out on the bowl, press the '–' button. The start sequence begins and the text 'Start' appears in the display.

P003613A

'Assembled according to manual? + = YES, – = NO'

3 If the bowl has been dismantled and assembled according to the instructions in the *Service Manual*, press the '+' button.

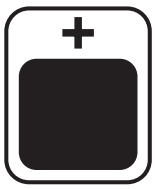


P003614A

'Bowl cleaned? + = YES, – = NO'

4 If the bowl has been cleaned press the '+' button.

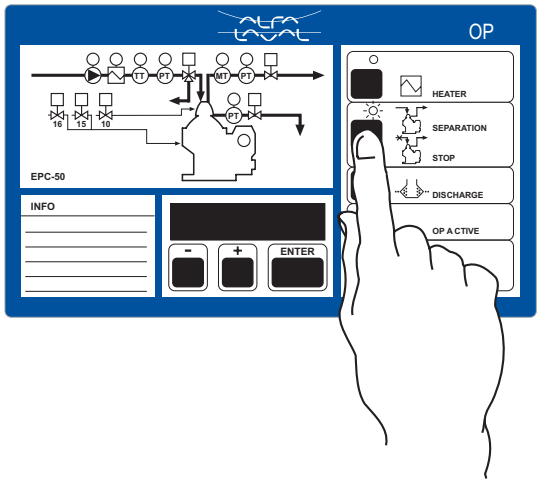
An automatic calibration of the system is carried out. See display.



P003614A

To stop the process, press the 'SEPARATION' button (see *1.6 Stop*, page 14.)

If the system is to be restarted, the system valves can remain in operating positions.



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1.11 Remote Operation

Remote Operation

NOTE

After maintenance, the system must be started locally.
If in Remote, and '+' is pushed in answer to the question 'Has the bowl been dismantled?', the system reverts to local control.

Follow the instructions in chapter *1.10 Automatic Operation*, page 18.

1.12 Emergency Operation

In the event of a water transducer failure, the system can still be operated by setting parameter Pr 4 in the EPC to standby mode (see the *Parameter List* booklet). The transducer is then disabled and the time to discharge automatically changes to 15 minutes. 'Nc' (not connected) is shown on the display. All Alcap functions are disabled. Water is removed only during a discharge. A reminder alarm is activated after 24 hours.

If the system oil contains plenty of water, and the oil density is less than 991 kg/m^3, emergency operation as described below is possible.

1.12.1 Manual Operation of the Separation System

In the event of extemely high water content, the system can be run manually by a competent engineer using the following instructions:

1. Ensure all oil system manual valves are in the correct position.
2. Set the selection switch on the control unit to the MANUAL position.
3. Fit a jumper between terminals X9:1, and X9:2 in the EPC.
4. Start the feed pump.
5. Start the separator.
6. Heat the oil to the correct separating temperature.
   Where there is a Heatpac® EHM electric heater, use jumpers in the power unit to bridge terminals X12.11 – X12.6, X12.11 – X12.9, and X12.11 – X12.7. Switch on the heater and use the switch to regulate the temperature.

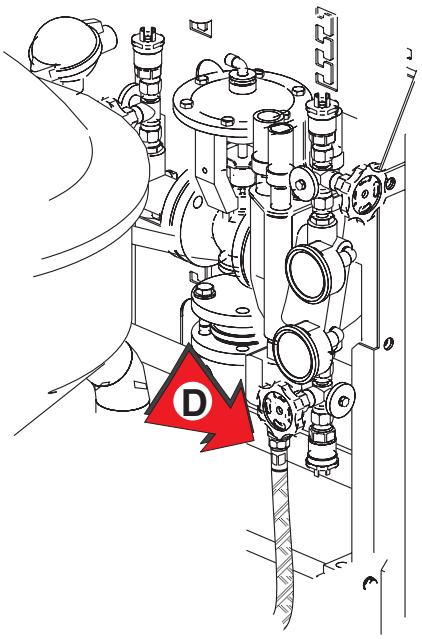
NOTE

Remove the jumpers after emergency operation.

7 When the separator is up to speed and the correct oil flow and temperature are achieved, close the bowl. Open SV15 for time specified in timer Ti60 (See *Parameter List* booklet).Wait 15 seconds. Open SV16 for time specified in timer Ti62. The bowl is now closed.

8 Temperature, flow, and backpressure must remain constant throughout.

9 Remove the water outlet pipe at D.



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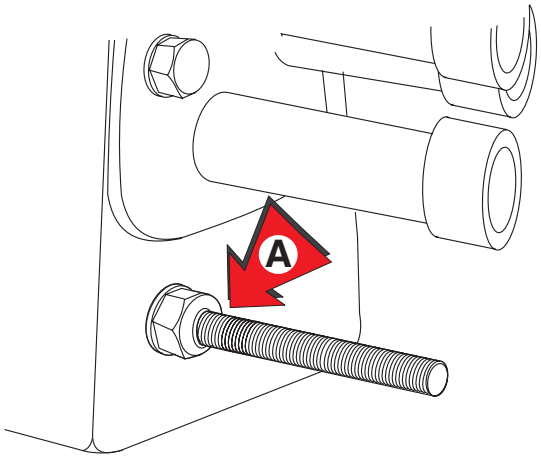
10 Screw in screw A to move the paring tube to its innermost position.

11 Open SV10 as follows:

	Time (secs.)	Amount bowl filled (litre)
SU 200/ 811/816/821/826	40	0.7
SU 300/820/825/830/831/835/836	40	1,1
SU 400/840/841/845/846	70	1.9
SU 500/850/851/855/856	30	3.0
SU 600/860/861/865/866	50	4.5



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12 Open SV1 to open oil feed V1.

13 Open SV5. This will open the water outlet valve V5.

14 Carefully screw out screw A until water starts to come from D.

15 Lock screw A in position.

WARNING

Breakdown hazard

During operation open SV16 for about 5 seconds every 10 to 15 minutes to ensure that the bowl remains closed.

Discharge

1 Close oil feed V1 using SV1.

2 Close water outlet V5 using SV5.

3 Open SV10 to add displacement water as follows:

	Time (secs.)	Amount bowl filled (litre)
SU 200/ 811/816/821/826	60	0.9
SU 300/820/825/830/831/835/836	49	1.3
SU 400/840/841/845/846	79	2.1
SU 500/850/851/855/856	44	4.0
SU 600/860/861/865/866	59	5.4

4 Open SV15 until a discharge is heard (about 3 seconds).

5 Wait 15 seconds.

6 Open SV16 for time specified in timer Ti62.

7 Open SV10 as follows:

	Time (secs.)	Amount bowl filled (litre)
SU 200/ 811/816/821/826	40	0.7
SU 300/820/825/830/831/835/836	40	1,1
SU 400/840/841/845/846	70	1.9
SU 500/850/851/855/856	30	3.0
SU 600/860/861/865/866	50	4.5

8 Open V1.

9 Open V5.

10 Maintain backpressure at normal setting throughout.

Breakdown hazard

Discharging of the bowl, and supervision of the operation, is now completely manual and under the direct responsibility of the engineer who has placed the separation system in the manual control mode.